DRAFT

"The attached draft information is provided as a tool for organizations developing their own means for evaluating medical waste treatment technologies. This information is provided only as a framework and is not for distribution and should not in any way be interpreted or represented as an official EPA document or test protocol."

CHEMICAL OR MECHANICAL/CHEMICAL TREATMENT

DESCRIPTION: A chemical disinfectant can be described as an agent which destroys disease causing or their harmful microorganisms. Disinfectant chemicals are registered under FIFRA by OPTS according to their use against particular types of pathogens. Disinfectants may be used alone or in combination with mechanical destruction devices or encapsulation agents.

OPERATING PARAMETERS: The effectiveness of treatment depends upon the characteristics of the disinfectant, the concentration of active ingredient, the contact time of the disinfectant with the waste, and the characteristics of the waste being disinfected.

WASTES SUITABLE FOR TREATMENT BY CHEMICAL DISINFECTION: Most medical waste items are suitable for treatment by chemical disinfection with the exceptions of body parts and contaminated animal carcasses which are excluded from treatment by chemical disinfection because of aesthetic reasons. Radioactive, hazardous, and cytotoxic wastes are also inappropriate for treatment by chemical disinfection.

INDICATOR ORGANISMS: Chemically resistant indicator organisms are selected to provide a maximum challenge. *Bacillus stearothermophilus* ATCC 12980 or ATCC 10149 (10^4) may be used to demonstrate a 4 $\log_{10}$ reduction of viable spores. These spores are not normally found in the medical waste stream, and can be recovered easily and are more selectively isolated due to their thermophilic growth requirements. Strains of *B. stearothermophilus* and *B. subtilis* have been shown to have essentially the same inactivation profiles from chemical exposure (Cole et al., 1991)

TEST PROCEDURE: A sufficient number of *B. stearothermophilus* spores must be added to the chemical treatment system to permit the recovery of enough organisms to demonstrate a reduction of at least 4 $\log_{10}$ of organisms in aliquot samples removed for recovery. Chemical systems are tested by comparing samples from the chemical treatment procedure with and without disinfectant. Spores are added to the system and liquid and solid samples collected at appropriate intervals after using either tap water or chemical disinfectant in the system.

The aliquot samples from the chemical treatment process should be neutralized immediately and the neutralized samples filtered and inoculated onto soybean-casein digest agar (or equivalent), streaked to quantify the samples, and incubated at 55 °C for at least 48 hours. At the end of the incubation period the organisms should be quantified to confirm that the appropriate level of spore reduction levels have been achieved. The samples collected from the chemically treatment procedure should demonstrate a 4 $\log_{10}$ reduction in the indicator spores in comparison to the tap water samples.